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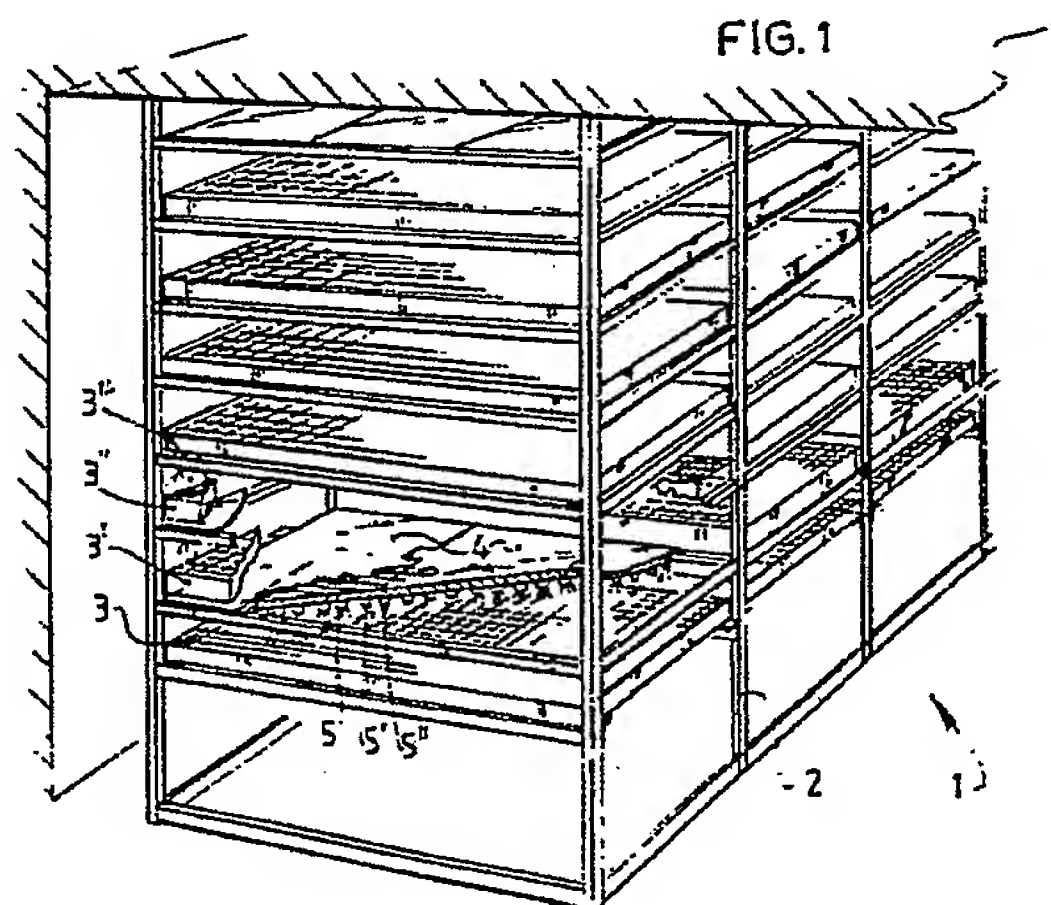
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(54) **Method and device for lighting seeds or plants.**

(57) Method for furthering plant seeds by means of artificial lighting from a light source consisting of LEDs (5). The light source consisting of LEDs does not radiate any heat and can be placed very close to the objects to be lighted.

The invention can be applied in warehouses, during transport in a vehicle for example.



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## METHOD AND DEVICE FOR LIGHTING SEEDS OR PLANTS

The invention relates to a method for furthering for example the germination of plant seeds and the cultivation of plant cuttings by artificial lighting thereof from a light source.

Such a method is known from WO-A-84/00693.

Used in the known method as light source are gas discharge tubes. Through the use of special gas fillings a required wave length range is obtained. The use of filters or coatings on the light sources for the purpose of filtering out an undesired part of the spectrum is avoided as a result.

Such gas discharge tubes however require a high energy consumption. The energy consumption lies in the order of magnitude of 36 W. In the case of incandescent lamps an energy consumption of 150 to 450 W can be expected.

The high energy consumption results in the development of a great deal of heat. A comparatively large spacing between the object for lighting and the light source must therefore be selected.

The invention has for its object to provide a solution for the above mentioned drawbacks. This is achieved according to the invention through the use of light emitting diodes (LEDs) as light source.

The invention derives from the insight that while it is true that with the use of a cold light source, as is the case with an LED, a limited lighting strength is achieved, because the light source does not radiate any heat it can be placed very close to the object for lighting. The consumption of an LED is approximately 50 mW. It has been found that with a correctly chosen wave length a lighting nevertheless takes place such that the intended purpose is achieved.

As a result of the invention it is possible to further plant growth in for example entirely darkened, closed accommodation.

A light source can be used for lighting with a light spectrum lying between 400 and 800 nm.

It is possible to supply a light source intermittently at high frequency, whereby a lighting strength can be selected that is greater than in the case of continuous operation. As a result of a certain slowness in plants the intermittent lighting is sensed as more or less continuous by the object for lighting and the speed of germination is not adversely affected as a result. Intermittent feed can also be applied for the saving of energy. The supply voltage used can be kept low, namely about 24 volts. This is of particular advantage in the case of use in means of transport. Further features and advantages of the invention will be elucidated with reference to the drawings.

In the drawings:

Fig. 1 shows a view of a nursery area as employed for the germination of seeds, and

fig. 2 a light source according to the invention.

The nursery area 1 is built up of a rack 2 in which trays 3, 3' are accommodated. Trays 3, 3' are filled with a substrate into which the seeds for germinating are inserted. Situated above each tray 4 is a group of LEDs 5, 5', 5". The LEDs are operative in the light spectrum of approximately 660 nm. This spectrum is optimal for rapid germination of seeds.

By means of a frequency control the ignition timing, and therefore the frequency of the lighting, is adjustable.

Because of the low heat production the packing in the nursery area can be more dense than in the case of known nursery areas.

### Claims

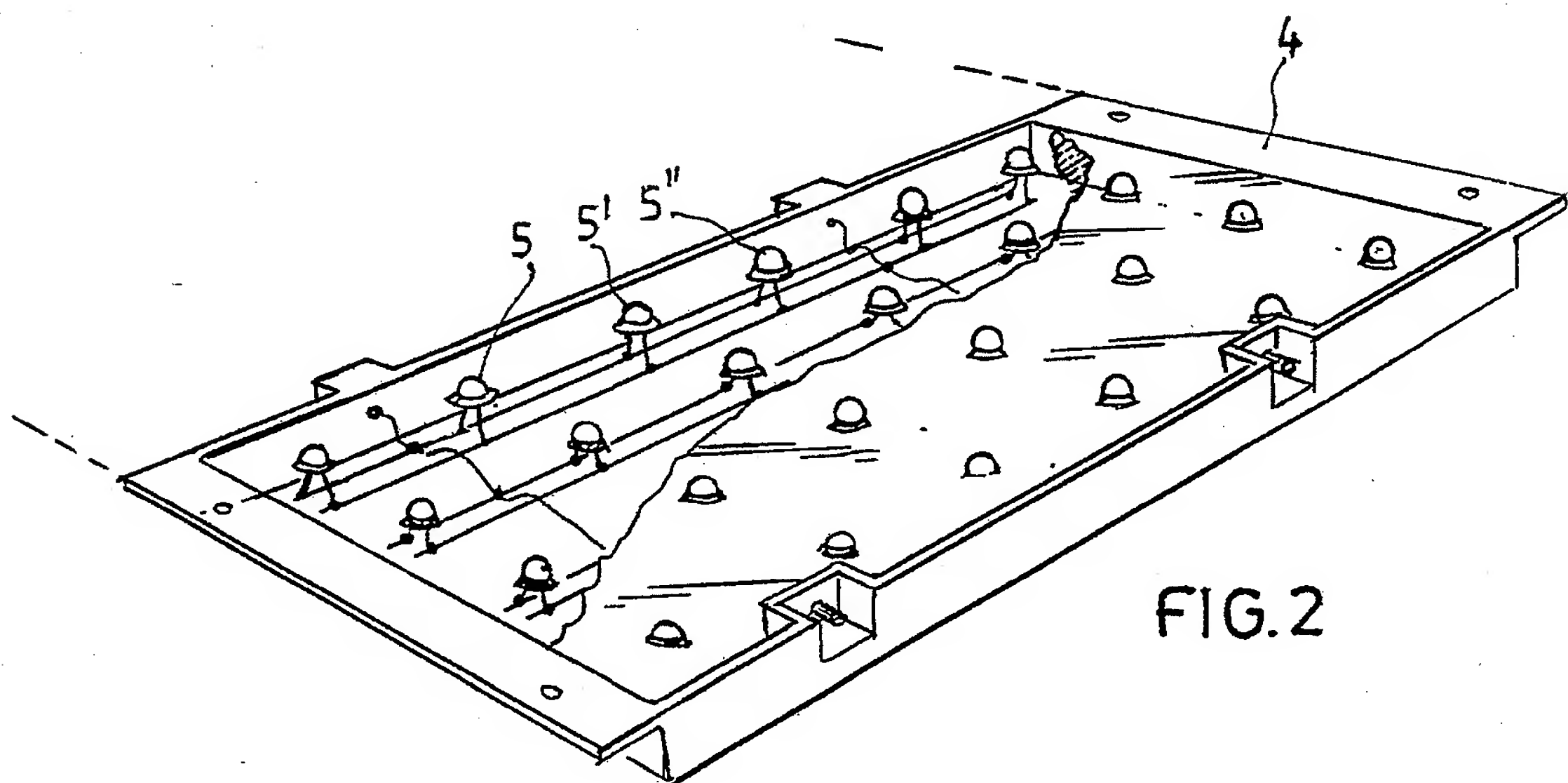
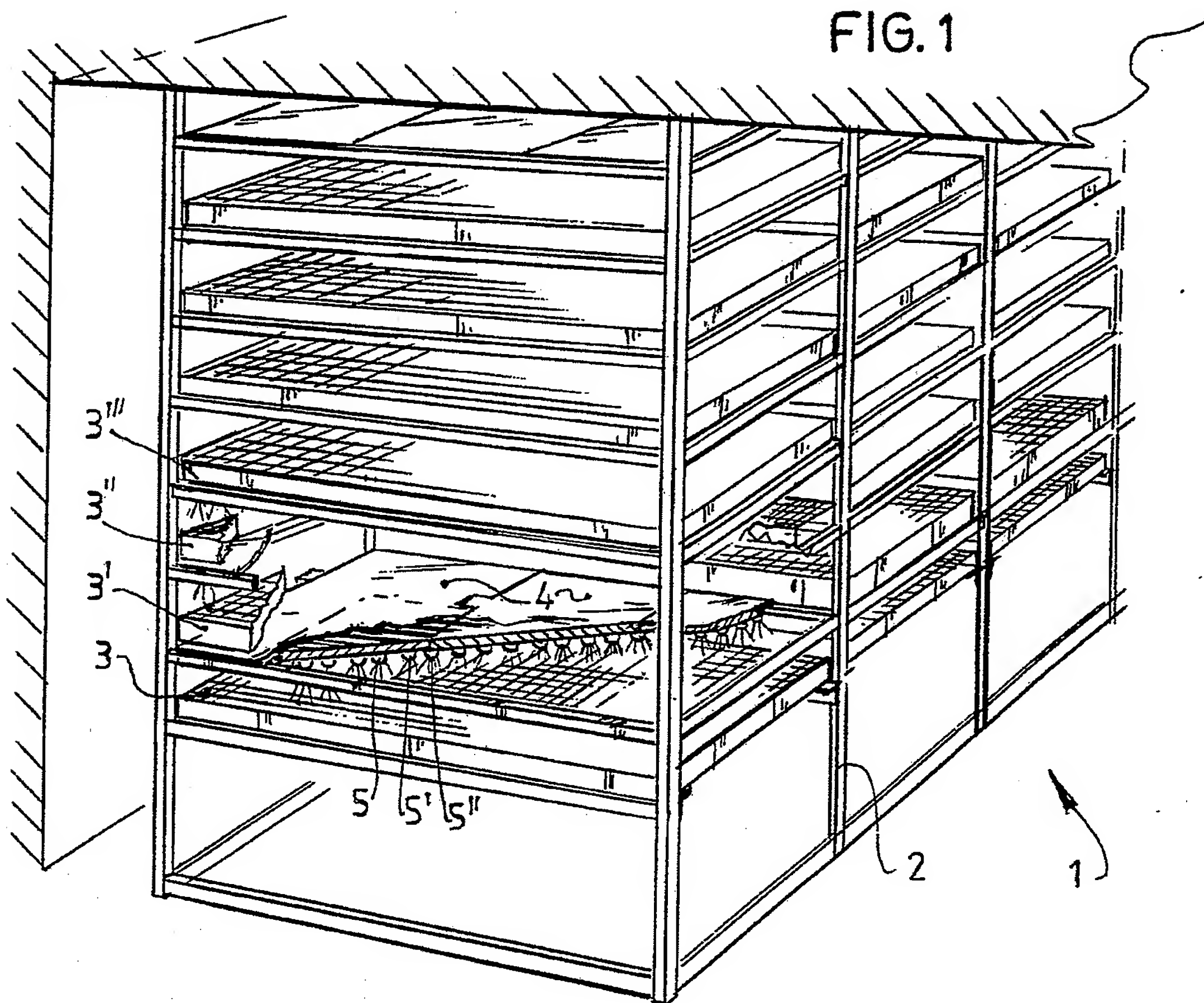
1. Method for furthering for example germination of plant seeds and the cultivation of plant cuttings by artificial lighting from a light source, **characterized in that** light emitting diodes (LEDs) are used as light source.

2. Method as claimed in claim 1 **characterized in that** bundles of rays of adjacent LEDs overlap each other.

3. Method as claimed in claim 1, **characterized in that** the light sources are supplied intermittently at high frequency.

4. Method as claimed in claims 1-3, **characterized in that** 24 volts is selected as supply voltage.

5. Method as claimed in claims 1-4, **characterized in that** the method is employed in a means of transport, for example a goods vehicle.





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## EUROPEAN SEARCH REPORT

Application Number

EP 88 20 1871

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
D,Y	WO-A-8400693 (SCHONBERG) * page 4, line 16 - line 29 *	1, 3	A01G7/04
Y	DE-A-2747596 (GIULINI) * page 9, paragraph 3 * * claims 1, 6, 7 *	1	
Y	US-A-3930335 (WIDMAYER) * abstract *	3	
A	US-A-4060933 (KADKADE) * claim 1 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			A01G A01C F21K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 DECEMBER 1988	Examiner HERYGERS J.J.
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document			